

中国民用航空局
CIVIL AVIATION ADMINISTRATION OF CHINA

型号认可证数据单

THE VALIDATION DATA SHEET

编号/No: VTC0071A

版次/Revision: 3

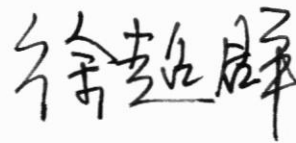
型号/Type: 747-400

747-400F

747-8F

747-8

批准人/Approved By:



日期/Date: 2018 年 4 月 12 日

本数据单是型号认可证(编号: VTC0071A)的组成部分, 它规定了符合中国民用航空局的适航要求所颁发此型号认可证的产品状态和限制。

This data sheet, which is part of Validation of Type Certificate (No: VTC0071A), prescribes condition and limitation under which the product for which the type certificate was issued meets the airworthiness requirements of the Chinese Civil Aviation Regulation.

型号认可证持有人/Validation of Type Certificate Holder:

The Boeing Company

1901 Oakesdale Avenue SW

Seattle, WA 98057-2623

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第 1 部分总则（所有型别）

SECTION 1 General (ALL MODELS)

1. CAAC 认可数据单和型号合格证数据单
CAAC Validation Data Sheet and Type Certificate Data Sheet

	中国民用航空局认可数据单号、版次和颁发日期 CAAC Validation Data Sheet Number, Revision and issuance date	型号合格证数据单号、版次和颁发日期 Type Certificate Data Sheet Number, Revision and issuance date
当前/ Current	VTC0071A 2018/04/12	FAA TCDS A20WE, Rev 54, Mar03, 2014
历史/ History	VTC0071A 2015/04/21 VTC0071A 2015/1/12 VTC0071A 2014/9/19 VTC0071A 1997/6/26 VTC0071A 2002/8/30	FAA TCDS A20WE, Rev 54, Mar03, 2014 FAA TCDS A20WE, Rev 54, Mar03, 2014 FAA TCDS A20WE, Rev 54, Mar03, 2014 FAA TCDS A20WE, Rev 27, Aug01, 1996 FAA TCDS A20WE, Rev 32, Mar08, 2002

2. 适航类别/Airworthiness Category: 运输类航空器/ Transport Category Aircraft
3. 认可当局/Validation Authority: 中国民用航空局/CAAC
审定当局/Certifying Authority: 美国联邦航空局/FAA
4. 型号合格证持有人/Type Certificate Holder: The Boeing Company
1301 Second Avenue
Seattle, Washington 98101
5. 认可审定基础/Validation Certification Basis
CAAC 的认可审定基础由 FAA 的审定基础(详见 FAA 型号合格证数据单: 编号 A20WE), 和 CAAC 的附加技术条件组成。
The CAAC validation certification basis consists of the FAA certification basis (refer to FAA Type Certificate Data Sheet No.A20WE, and the CAAC additional technical conditions.

第 2 部分/SECTION 2: 747-400

I. 总则/General

1. 型别/Model: 747-400
2. 适航类别/Airworthiness Category: 运输类航空器/Transport Category Aircraft
3. 型号合格证持有人/Type Certificate Holder: The Boeing Company
1901 Oakesdale Avenue SE, M/C OA1-37
Seattle, WA 98057-2623
4. FAA 批准日期/FAA Approved Date: 1989.01.10/10 Jan 1989
5. CAAC 批准日期/CAAC Approved Date: 1997.06.26/26 Jun 1997

II. 认可审定基础/Validation Certification Basis

CAAC 的认可审定基础由 FAA 的审定基础（详见 FAA 型号合格证数据单：编号 A20WE Rev. 27 中的 747-400 型别的审定基础）加上两个等效安全 PS06-0496-F-18、PS08-0670-C-1，和 CAAC 的附加技术条件组成。

PS06-0496-F-18 § 25.1555(d)(1) 发动机和辅助动力装置防火开关手柄设计。

PS08-0670-C-1 § 25.853(a) 内饰板结合处使用的胶黏剂。

The CAAC validation certification basis consists of the FAA certification basis (refer to 747-400 section of FAA Type Certificate Data Sheet No.A20WE, Rev. 27) and two Equivalent Safety Findings PS06-0496-F-18, PS08-0670-C-1, and the CAAC additional technical conditions.

PS06-0496-F-18 § 25.1555(d)(1) ELOS Engine and Auxiliary Power Unit (APU) Fire Switch Handle Design.

PS08-0670-C-1 § 25.853(a) for Adhesives Used in Interior Panel Joint Potting Applications.

中国民用航空局附加技术条件/CAAC Additional Technical Conditions.

III. 技术特征和运行限制 /Technical Characteristics and Operational Limitations

发动机/Engines:

四台普惠公司 PW4000 系列发动机，或通用电气公司 CF6-80C2B1F 发动机。
PW4000 系列发动机型号合格证编号 E24NE，型号认可证编号 VTC0248E，版次 13；CF6-80C2B1F 发动机型号合格证编号 E13NE，型号认可证编号 TV88009，版次 1。

关于发动机混装，见注释 3。

4 Pratt and Whitney PW4000 Series, or General Electric CF6-80C2B1F.
PW4000 Series engine Type Certificate No. E24NE, VTC No. VTC0248E, Rev. 13. CF6-80C2B1F engine Type Certificate No. E13NE; VTC No. TV88009, Rev.1.

See Note 3 regarding intermixing engines.

发动机推力限制/Engine Thrust Limits:

发动机型号/ Engine Models:	PW4056	PW4062A	CF6-80C2B1F
推力限制/ Thrust Limits:	56,750 lbs.	62,000 lbs.	57,160 lbs.
起飞，海平面，标准天（5 分钟）最大连续/Takeoff,	47,970 lbs.	47,970 lbs.	49,800 lbs.

Sea Level, Standard Day (5 minutes) Maximum Continuous

燃油/Fuel:

见注释 4。
See Note 4.

空速限制/Airspeed Limits:

$V_{MO}/M_{MO} = 365/0.92$ (KCAS).

对于其它空速限制, 见适用的 FAA 批准的飞机飞行手册。

See the appropriate FAA Approved Airplane Flight Manual for other airspeed limits

重心范围/ C.G. Range:

见适用的 FAA 批准的飞机飞行手册。

See the appropriate FAA approved Airplane Flight Manual.

最大重量/Maximum Weights:

见适用的 FAA 批准的飞机飞行手册。

See the appropriate FAA approved Airplane Flight Manual.

最大行李舱/货舱装载/Maximum Baggage/Cargo:

见重量平衡控制装载手册。

See Weights and Balance Control and Loading Manual.

燃油/滑油量/Fuel/Oil Capacity:

见重量平衡控制装载手册。

See Weights and Balance Control and Loading Manual.

FAA 批准的重量平衡控制装载手册: D043U400。

FAA approved Weights and Balance Control and Loading Manual: D043U400.

FAA 批准的飞机飞行手册: D6-U10001, D6-U10002, D6-U10003。

FAA approved Airplane Flight Manual: D6-U10001, D6-U10002, D6-U10003.

型号/Model

适用的序列号/Eligible Serial Numbers

747-406

23982,23999-24001,24201,24202,24517,24518,25086,25087,25356,25413,26372-26374,27202

747-409

24309-24313,27965

747-412

24061-24066, 24226, 24227, 24975, 25068, 25127, 25128, 26547-26552, 26554-26555, 26556, 26562, 27066-27070, 27132-27134, 27137, 27178, 27217, 28022

747-419

24386, 24855, 25065

747-422

24322, 24363, 24380-24385, 25158, 25224, 25278, 25279, 25379, 25380, 25395, 26875-26881, 26890

747-428

24969, 24990, 25238, 25302, 25344, 25599-25602, 25628-25630

747-430

23816, 23817, 24285-24288, 24715, 24740, 24741, 24761, 24966, 24967, 25045-25047,26425-26427, 28086

747-433

24998, 25074, 25075

747-436

23908-23911, 24047-24058, 24447, 24629, 24630, 25406, 25427, 25432, 25434, 25435, 25809,25810-25814, 25817-25824, 27090-27092, 27349, 27350

747-437

27078, 27164, 27165, 27214

747-438

24354, 24373, 24406, 24481-24483, 24779, 24806, 24887, 24974, 25067,

	25151, 25245, 25315, 25544-25547
747-441	24956, 24957
747-444	24976, 25152, 26637, 26638
747-446	24423-24427, 24777, 24784, 24870, 24885, 24886, 25064, 25212, 25260, 25308, 26341-26344, 26346, 26350, 26353, 26355, 26356, 27099
747-451	23719, 23720, 23818-23821, 24222-24225, 26473, 26474
747-458	26055, 26056, 27915
747-467	23814, 23815, 24631, 24850, 24851, 24925, 24955, 25082, 25211, 25351, 25869-25874, 27117, 27230, 27595
747-469	27338, 27663
747-475	24883, 24895, 24896, 25422
747-481	24801, 24833, 24920, 25135, 25207, 25641, 25645
747-45E	26062, 27062, 27063, 27141, 27142, 27154, 27173, 27174, 27898, 27899, 28092, 28093
747-47C	24730, 24731
747-48E	25405, 25452, 25777-25780
747-4B3	24154, 24155
747-4B5	24198-24200, 24619, 24621, 25205, 25275, 26392-26398, 26400, 26402-26405, 26407, 26409, 26412, 27072, 27177, 27341, 27662, 28096
747-4D7	24458, 24459, 24993, 25366, 26609, 26610, 26615, 26616, 27093, 27723
747-4F6	27261, 27262, 27602, 27827, 27828
747-4H6	24315, 24405, 24836, 25126, 25699-25703, 27042-27044
747-4J6	24346-24348, 25879-25883
747-4Q8	24958, 26255, 26326
747-4U3	25704, 25705

发动机限制见 FAA 批准的飞机飞行手册或适用的发动机型号合格证数据单/For engine operating limits see the FAA Approved Airplane Flight Manual or the appropriate engine type certificate data sheet:

普惠/Pratt and Whitney: E24NE
通用电气/General Electric: E13NE

推力设置/Thrust Setting:

必须使用 AFM 第 4 节中适当的 EPR 或 N1 推力设置曲线控制发动机推力。

The appropriate EPR or N1 thrust setting curves in Section 4 of the Airplane Flight Manual (AFM) must be used for control of engine thrust.

最大使用高度/Maximum Operating Altitude:
45100ft.

最小机组/Minimum Crew:

对于所有飞行，2 人（机长和副驾驶）。当载有乘客时，每个 3 号翼上出口需配有一个空乘人员。如果上层客舱载有乘客，则在滑行、起飞和着陆时，上层客舱需配有至少一名空乘人员。

For all flights, 2 persons (pilot, copilot). When passengers are being carried, one attendant is required at each No. 3 over-wing exit. At least one flight attendant is required on the upper deck during taxi, takeoff, and landing when passengers occupy the upper deck.

最大载客数/Maximum Passengers:

所有 747-400 飞机，乘客数量限制为：

660 乘客：构型为主客舱有五组 A 类出口，且上层客舱有一组 A 类出口。（如果符合修订后的专用条件 25-71-NW-3（1981 年 8 月 3 日通过 FAA 信函发送给波音）的要求，则主客舱人数限制为 550 人，上层客舱人数限制为 110 人）见注释 5。/660 passengers with 5 pair of Type "A" exits on main deck plus one pair of Type "A" exits on the upper deck. (Main deck limited to 550 and upper deck limited to 110 if in compliance with the requirements of modified Special

Condition Number 25-71-NW-3, transmitted to Boeing by FAA letter dated August 3, 1981.) See NOTE 5.

所需设备/Required Equipment:

适用的适航规章中所规定的基本所需设备（见审定基础）必须安装在审定的飞机上。型号设计数据中说明了所需设备。

The basic required equipment as prescribed in the applicable airworthiness regulations (See Certification Basis) must be installed in the aircraft for certification. The required equipment is noted in the Type Design Data.

基准/Datum:

平衡力臂基准对应于机身 0 站位，即机头前 90 英寸。所有生产站位数值上保持与力臂一致。基准点距离前起落架顶升点的水平距离为 384.7 英寸。

Balance Arm Datum corresponds to Body Station 0 and is 90 inches forward of nose. All productions stations coincide numerically with arms. Horizontal distance of datum to nose gear jack points is 384.7 inches.

平均气动弦长/MAC:

MAC 长度为 327.8 英寸。MAC 前缘在基准点之后 1258 英寸。

MAC length is 327.8 inches. Leading edge of MAC is 1258 inches aft of datum.

水平测量措施/Leveling Means:

在 BS1444.0 右侧轮舱处，有吊线锤挂点和水平测量标尺。

A plumb-bob attachment and leveling provision scale are provided in the R.H. body wheel well at BS 1444.0.

控制面运动/Control Surface Movements:

为了保证飞机的正常运行，必须通过飞行控制系统的正确校装来严格控制各种操纵面的运动。因此，飞机必须按以下 FAA 批准的文件进行校装：

To insure proper operation of the airplane, the movement of the various control surfaces must be carefully controlled by proper rigging of the flight control systems. The airplane must, therefore, be rigged according to the following FAA-approved data:

波音图纸编号：

Boeing Drawing Numbers:

251U1001 副翼和扰流板校装说明

251U2001 升降舵校装说明

251U3002 方向舵校装说明

251U4001 安定面配平校装说明

253U5001 校装说明—控制台（包括襟翼控制组件）

256U2001 前缘襟翼控制校装说明

256U3001 后缘襟翼控制校装说明

251U1003 减速板校装说明

251U1001 Rigging Procedures Aileron and Spoiler

251U2001 Rigging Procedures Elevator

251U3002 Rigging Procedures Rudder

251U4001 Rigging Procedures Stabilizer Trim

253U5001 Rigging Procedure - Control Stand (Includes flap control assembly)

256U2001 Rigging Procedures Leading Edge Flaps

256U3001 Rigging Procedures Trailing Edge Flaps

251U1003 Rigging Procedures Speed Brakes

服务信息/ Service Information:

波音报告 D6-34U102 “结构修理手册”是经 FAA 批准的。服务通告和其他服务信息，如经 FAA 批准，将起到同样的作用。

Boeing Report D6-34U102, "Structural Repair Manual," is FAA-approved. Service Bulletins and other Service information, when FAA-approved, will carry a statement to that effect.

审定维修项目/ Certification Maintenance Requirements (CMR's):

CMR 在 FAA 批准的波音公司维修大纲文件 D6-21U400 第 9 节或者适用的发动机型号合格证数据单中。应以二者中更为严格的要求为准。

The CMR's are listed in either the FAA-approved Section 9 of Boeing Maintenance Planning Data Document D6-21U400 or the applicable engine Type Certificate Data Sheet. The more restrictive requirement from these two documents shall be in force.

生产许可/ Production Basis:

生产许可证编号：700。

Production Certificate No. 700.

设备 / Equipment:

在适用的适航规章（见审定基础）中规定的基本必备设备，必须安装在审定的飞机上。

The basic required equipment as prescribed in the applicable airworthiness regulations (see Certification Basis) must be installed in the aircraft for certification.

IV.经批准的中文标记标牌/ The Approved Chinese Placard

以下中文标记标牌已由 CAAC 接受并由 FAA 批准：

The following Chinese Placards have been accepted by CAAC and approved by FAA:

序号 Code	标题 Title	编号 Number	版本（见注释 16） Rev./See Note 16
1	747 Bilingual (Chinese) Placards and Markings	D6-36621-6	C

V. 注释/Notes

注释/NOTE 1: 除非运营人具有经批准的用于重量控制的系统，否则，从飞机首次获得适航证之时起及其以后的所有时间，必须为每架飞机提供一份现行有效的重量和平衡手册（包括审定空重所包含的设备清单）以及装载说明。
A current Weight and Balance Manual including a list of equipment included in the certificated empty weight and loading instructions must be in each aircraft at the time of original airworthiness certification and at all times thereafter except in the case of an operator having an approved weight control system.

注释/NOTE 2: 飞机运行必须依照 FAA 批准的飞机飞行手册。FAA 批准的飞行手册、适用的运行规章或审定基础所要求的所有标牌，必须安装到飞机上。
Airplane operation must be in accordance with the FAA Approved Airplane Flight Manual. All placards required by either the FAA Approved Airplane Flight Manual, the applicable operating rules or the certification basis must be installed in the airplane.

注释/NOTE 3: 在 FAA 批准的飞行手册中适用的限制下，通用电气公司 CF6-50C 发动机可

与 CF6-50E 发动机混装。/The General Electric CF6-50C engines may be intermixed with CF6-50E engines with appropriate limitations noted in the FAA Approved Airplane Flight Manual.

注释/NOTE 4:

普惠公司发动机可使用以下燃油：符合普惠规范 522E 或之后版本的 JP-1, JP-4, 和 JP-5 燃油，如对发动机工作或功率输出没有不利影响，可单独使用或以任何比例混合使用以上燃油。转换不同牌号燃油不需要调整燃油控制。/The following fuels are eligible for Pratt and Whitney engines: JP-1, JP-4, and JP-5 fuels conforming to the P&WA Specification No. 522E or later revision may be used separately or mixed in any proportion without adversely affecting the engine operation or power output. No fuel control adjustment is required when switching fuel types.

通用电气公司发动机使用符合 GE 规范 D50TF2 的燃油。MIL-T-5624, Grades JP-4 or JP-5, ASTMD1655, Jet A, Jet A1, 和 Jet 8 与该规范一致。【JP-8 也被批准用于 CF6-80C2 系列发动机。】装有件号为 9331M72P33 滴流燃油喷嘴的 CF-80C2 系列发动机禁止使用 JP-4 和 Jet B（宽馏分）燃油。/G.E. engines use fuels conforming to G.E. Spec. D50TF2. MIL-T-5624, Grades JP-4 or JP-5, and ASTMD1655, Jet A, Jet A1, and Jet 8 are consistent with G.E. Specifications. [JP-8 is also approved for use in CF6-80C2 Series engines.] CF-80C2 series engines incorporating Dribble Flow Fuel Nozzles PN9331M72P33, P34 and P41 are prohibited from the use of JP-4 and Jet B (wide cut) fuel.

在已批准燃油中唯一可选的添加剂如下/The only optional additives that may be used in approved fuel are as follows:

- 1) 抗静电剂-Shell ASA3, 浓度不超过 1.0ppm (1.0 克/立方米) /Anti-static additive - Shell ASA3 in concentrations not exceeding 1.0 parts per million (grams per cubic meter).
- 2) 防冰剂- Specification D. Eng. R.D. 2451 (Issue 2) or MIL/1/27686E, 浓度不超过 0.15% (体积浓度) /Anti-icing additive - Specification D. Eng. R.D. 2451 (Issue 2) or MIL/1/27686E in concentrations not exceeding 0.15 percent by volume.
- 3) 防腐剂/润滑剂-可以使用 HITEC E515 (先前使用 Santolene C), 浓度不超过 5 磅/35000 英制加仑, 使得含磷量在 0.07ppm 量级 (体积比) /Anti-Corrosion/lubricity additive - HITEC E515 may be used (formerly Santolene C) at a concentration range up to 5 lb. per 35,000 Imperial gallons, which gives a phosphorus content in the order of 0.07 parts per million.
- 4) 抗微生物添加剂-Biobor JF, 可间歇性加入或不连续加入保持浓度不超过 270 ppm(硼含量 20ppm)。允许消耗掉的燃油中含量不得超过 270 ppm, 且燃油没有被微生物碎片污染。/Anti-microbiological additive - Biobor JF may be used on an intermittent or not-continuous basis at a concentration level not exceeding 270 parts per million (20 ppm Boron). It is permitted to burn off the treated fuel provided the concentration does not exceed 270 ppm, and the fuel is not contaminated by microbial debris.
- 5) 防腐剂/ Corrosion inhibitor additive:
 - a) TOLAD 245-浓度不得超过 12 磅/35000 英制加仑(约 35mg/L) / TOLAD 245 - in concentrations not exceeding 12 lb. per 35,000 Imperial gallons (approximately 35 mg/L).
 - b) APOLLO PRI 19-浓度不得超过 8 磅/35000 英制加仑 (约 23mg/L) / APOLLO PRI 19 - in concentrations not exceeding 8 lb. per 35,000 Imperial gallons (approximately 23 mg/L).
 - c) EMERY 9855-浓度不得超过 12 磅/35000 英制加仑 (约 35mg/L) /EMERY 9855 - in concentrations not exceeding 12 lb. per 35,000 Imperial gallons (approximately 35 mg/L).

燃油装载和使用限制在适用于每一个运营人的 FAA 批准的飞行手册中。/Fuel load and usage limitations are contained in the FAA Approved Airplane Flight Manual applicable to each operator.

发动机可使用的滑油如下/The following oils are eligible for the engines:

普惠公司：符合修订过的普惠规范 521 的合成型/ Pratt & Whitney: Synthetic type conforming to P&WA 521 as revised.

普惠涡轮喷气发动机/P&WA Turbojet Engine

服务通告 238 列出了批准的滑油品牌/Service Bulletin No. 238 lists approved brand oils.

通用电气公司：GE 发动机使用符合 GE 规范 D50TF1 A、B 级的合成型滑油。GE 服务通告 79-1 列出了批准的滑油品牌。/General Electric: G.E. engines use synthetic type oil conforming to G.E. Spec. D50TF1, classes A and B. G.E. Service Bulletin 79-1 lists approved oil brands.

注释/NOTE 5:

在一些 747-400 飞机上，由于内饰原因，其上层客舱出口等级为 I 类。1989 年 8 月 1 日 FAA 信函 ANM-120S: RSY 明确了该出口重新定级的要求。这些飞机的乘客数量与 747-200B（总乘客数 550 人，上层客舱 45 人）飞机相同。/On certain 747-400 airplanes, the Upper deck exits are rated as a Type "I" due only to the interior arrangement. Requirements for the rerating of the exit are located in FAA Letter ANM-120S: RSY, dated August 1, 1989. The passenger capacity of these airplanes is the same as for the 747-200B (550 total passengers with up to 45 on the upper deck.)

在另外一些 747-400 飞机上，由于内饰原因，其 3 号出口等级为 I 类。1988 年 12 月 21 日 FAA 信函 ANM-120S: JG 明确了该出口重新定级的要求。这些飞机的总乘客数限制为 485 人，上层客舱 45 人（若上层客舱也是 I 类出口）。如果上层客舱为 A 类出口，则总乘客数为 595 人（主客舱 485 人，上层客舱 110 人）。/Also on certain 747-400 airplanes, Door No. 3 is rated as a Type "I" due only to the interior arrangement. Requirements for the rerating of the exit are located in FAA Letter ANM-120S: JG dated December 21, 1988. The passenger capacity is limited to 485 total with up to 45 on the upper deck when the upper deck is also rated as Type "I". With the upper deck rated as a Type "A" the passenger capacity is 595 total (485 main deck plus 110 on the upper deck).

注释/NOTE 6:

限寿件和检查要求/Life Limited Parts and Inspection Requirements:

前起落架/Nose Landing Gear:

前起落架的寿命限制是 50,430 次着陆。该服役寿命可根据服役航段平均时间修正至飞行小时，但必须获得 FAA 批准。/The nose landing gear is life-limited to 50,430 landings. This service life may be corrected to flight hours based on service route segments average times and must be approved by the FAA.

加油扰流板/Refueling Spoiler:

加油扰流板 P/N 65B20238 限制为 20,000 空中操作。/Inflight refueling spoiler P/N 65B20238 is limited to 20,000 inflight operations.

逃生系统/Escapes System:

由 Olin 公司制造的逃生系统冷气发生器组件，如果储存在原装（未开封）运输容器或在 +10°F 至 +90°F 的冷气发生器中，自生产之日起 6 年内可用。如果冷气发生器组件储存超过 6 年，不得使用。服役中的冷气发生器组件寿命限制是 3 年。/Escape system cool gas generator cartridges manufactured by Olin Corporation and stored either in their original (unopened) shipping

canisters or in a cool gas generator between +10°F and +90°F for up to 6 years from date of manufacture are considered serviceable. Cartridges stored for more than 6 years must not be put into service. In service cartridge life is limited to 3 years.

由 Talley 工业制造的逃生系统冷气发生器组件（参考波音服务通告 747-25-2448），其存储限制是自生产之日起 7 年。如果冷气发生器组件储存超过 7 年，不得使用。服役中的冷气发生器组件寿命限制是 3 年。/Escape system cool gas generator cartridges manufactured by Talley Industries (Ref. Boeing Service Bulletin 747-25-2448) have a storage limit of 7 years from the date of manufacture. Cartridges stored for more than 7 years must not be put in service. Inservice cartridge life is limited to 3 years.

逃生系统翼上撤离滑梯门和门解除装置（每架飞机6个）使用15次后必须更换。此外，如果座体内径超出最大图纸公差0.002英寸，也必须更换座体。门解除装置组件超过5个日历年（自生产之日起）时间必须更换。/Escape system off-wing slide door and latch thruster (six each per airplane) must be replaced after 15 firings. In addition, the housing bore must be replaced if the bore is 0.002 inches more than the maximum drawing tolerance. Thruster cartridges must be replaced before 5 years calendar time after date of manufacture.

747-400F 短舱撑杆弹簧梁组件/747-400F Nacelle Strut Spring Beam Assemblies:

以下弹簧梁组件寿命限制为 50,000 次着陆/The following spring beam assemblies are life limited to 50,000 landings.

发动机安装 Engine Installation	发动机位置 Engine Position	件号 Part Number
GE CF6-80C2 系列	1	311U0050-46 and -48
GE CF6-80C2 Series	4	311U0050-42 and -44
PW 4000 系列	1	311U0050-46 and -48
PW 4000 Series	4	311U0050-50 and -52

发动机吊挂-要求的检查/Engine Pylon - Required Inspections:

除 747-400 飞机以外，对于含有球轴承撑杆梁的所有外侧发动机吊挂，必须每 6,000 飞行小时检查一次轴承卡死情况。747-400 飞机的该检查间隔不能超过 12,500 小时。波音公司维修大纲文件 D6-13747, 或 D621U400 (747-400 飞机) 中给出检查程序或等效的检查程序是可接受的。

All outboard engine pylons incorporating the strut beams with spherical bearings must be inspected for bearing seizure every 6,000 flight hours on all models except for the 747-400 airplane. The inspection interval shall not exceed 12,500 hours for the 747-400 airplane. Inspection procedures specified in Boeing Maintenance Planning Document D6-13747, or D621U400 for the 747-400 airplane, or equivalent are acceptable.

注释/NOTE 7:

内开门和固定的短舱唇口的组合可混装，适用的限制信息见 FAA 批准的飞机飞行手册及其适用附录。

Blow-in door and fixed lip nacelles may be intermixed in the combinations and the appropriate limitations noted in the FAA Approved Airplane Flight Manual and in the appropriate Appendix of the Airplane Flight Manual.

注释/NOTE 8:

要求进行改装以消除对型号审定基础不符合的服务通告在波音公司文件 D6-30300 “服务通告 747” 中列出。如果进口到美国的飞机按未经 FAA 批准的服务通告进行了改装，则需评估飞机的记录以确认该飞机完成了必要的改装并满足了符合性要求。。

There are service bulletins which call for modifications which do not comply

with the Type Certification Basis. These service bulletins are listed in Boeing Document D6-30300 titled "Service Bulletin 747". The records of airplanes imported into the USA should be reviewed to be sure that further modifications are accomplished to ensure compliance, if the non FAA-approved service bulletins modifications have been installed.

注释/NOTE 9:

生产线号为 679, 685, 696, 700, 705, 708, 710 及以后的飞机是 1988 年 8 月 20 日之后生产的；生产线号为 804 及后续的飞机是 1990 年 8 月 20 日之后生产的（参见 FAR121.312(a)(1)，修正案 121-198）。生产线号为 805 至 814 的飞机豁免（豁免编号：5176A）。生产线号、序列号和批次号之间的相互关系见波音公司文件 D6-30300 “服务通告 747”。

Airplanes line number 679, 685, 696, 700, 705, 708, 710, and on were manufactured after August 20, 1988, and Airplane line numbers 804 and subsequent were manufactured after August 20, 1990, (Reference FAR 121.312(a)(1) Amendment 121-198). Airplane line numbers 805 through 814 are exempt (Exemption No. 5176A). See Boeing Document D6-30300 titled "Service Bulletin 747" for cross reference of line number to serial number to block number.

注释/NOTE 10:

信息类别定义/Message Category Definitions

1. 警告/Warning: 需要机组立即进行改正或补偿动作的运行或飞机系统状态。/Defined as an operational or aircraft system condition which may require immediate corrective or compensatory action by the crew.
2. 戒备/Cautions: 需要机组立即知晓并随后采取补偿动作的运行或飞机系统状态。/An operational or aircraft system condition which requires immediate crew awareness and prompt compensatory action.
3. 提示/Advisories: 需要机组知晓并可能采取后续补偿措施的运行或飞机系统状态。An operational or aircraft system condition which requires crew awareness for possible future compensatory action.
4. 通知/Memo: 提示机组所选择正常状态的当前情况。/Crew reminders of the current state of selected normal conditions.
5. 状态/Status: 飞机派遣状态的指示。/Indications of airplane's condition for dispatch.
6. FMC 告警/FMC Alerts: 与那些需要机组知晓并后续可能采取补偿措施的 FMC 相关运行状态的提示信息关联。/Associated with advisories - FMC related operational conditions which require crew awareness for possible future compensatory action.
7. CMC 信息/CMC Messages: 飞机故障相关的、详细的（维护层级）信息。/Detailed (maintenance level) messages related to airplane faults.

注释/NOTE 11:

信息、操作、动作和责任/MESSAGE, OPERATION, ACTION AND RESPONSIBILITY:

信息	责任	运行阶段	快速程度	
			需要知晓	需要动作
警告	飞行员	所有	立即	立即
戒备	飞行员	所有	立即	随后
提示	飞行员	所有	及时	及时*
状态	地勤人员和飞行员	签派	签派	签派之前，依据 MMEL
FMC 警告	飞行员	所有使用 FMC 的阶段	即时	即时（如需）
FMC 咨询	飞行员	所有使用 FMC 的阶段	即时	即时（如需）
CMC	地勤和维护人员	签派准备和检查	CMR 或维护有要求时	CMR 或计划维修

*取决于其他故障、飞行阶段或飞机运行环境

Message	Responsibility	Phase of Operation	How Quickly is:	
			Awareness Req'd	Action Req'd
WARNING	PILOTS	ALL	IMMEDIATE	IMMEDIATE
CAUTIONS	PILOTS	ALL	IMMEDIATE	PROMPT
ADVISORIES	PILOTS	ALL	TIMELY	TIMELY*
STATUS	GROUND CREW AND PILOTS	DISPATCH	DISPATCH	BEFORE DISPATCH, DEPENDS ON MMEL
FMC ALERTS	PILOTS	ALL WHEN USING FMCs	TIMELY	TIMELY (if required)
FMC	PILOTS	ALL WHEN USING FMCs	TIMELY	TIMELY (if required)
ADVISORIES				
CMC	GROUND CREW & MAINTENANCE	DISPATCH PREPARATION & CHECKS	WHEN REQ'D BY CMR OR MAINTENANCE	CMR OR SCHEDULE A MAINTENANCE

*Depends on other failures, phase of flight or context of operation of airplane.

注释/NOTE 12: 波音 747 补充结构检查文件 D6-35022 (见 AD 84-21-02, 版本 39-4936) 将在 FAA 工程人员确定的时间内进行修订以包含 747-400。
The Boeing 747 Supplemental Structural Inspection Document D6-35022 (See AD 84-21-02, Amendment 39-4936) will be revised to include the 747-400 at a time to be determined by FAA engineering.

注释/NOTE 13: 波音生产线号为 1047 及以后的飞机在生产过程中已贯彻了 747 吊挂改装项目。吊挂到机翼的连接结构符合以下修正案水平的 FAR 审定基础/Boeing production line numbers 1047 and on have incorporated the 747 strut modification program in the production sequence. The certification basis for the strut-to-wing attachment structure complies with the following FAR's at the upgraded amendment levels listed below:

规章条款	条款名称	修正案水平
25.301, 25.303, 25.307	总则-结构	78
25.305	强度和变形	54
25.321 至 25.563	载荷工况	78
25.571	损伤容限	45
25.581 至 25.625	设计和构造	78
25.629	气动弹性稳定性	78

FAR(s)	Subject	Amendment Level
25.301, 25.303, 25.307	General Structure	78
25.305	Strength and Deformation	54
25.321 through 25.563	Load Conditions	78
25.571	Damage Tolerance	45
25.581 through 25.625	Design and Construction	78
25.629	Aerodynamic Stability	78

注释/NOTE 14: 已删除。/Deleted.

注释/NOTE 15: 对于 747-400 和-400F 系列飞机: 在 SFAR 88 项目期间以及表明对 14 CFR 25.981 和专用条件 25.285-SC 符合性时所确定的关于燃油箱系统的强制更换时间、检查间隔、相关检查程序和所有关键设计构型控制限制, 均列在 FAA 批准的波音 747-400 维修大纲文件 D621U400-9 (版本: 2005 年 8 月或之后 FAA 批准的版本) 第 9 节“适航限制和审定维修要求”中。生产线号 1377 及之后的 747-400 和-400F 系列飞机, 必须符合 D621U400-9 (2006 年 3 月或之后 FAA 批准的版本)。FAA 计划发布一份适航指令强制符合 D621U400-9 (2006 年 3 月或之后 FAA 批准的版本) 的要求, 适用于所有生产线号小于 1377 的 747-400 和-400F 系列飞机。

For Model 747-400 and -400F series airplanes: Mandatory replacement times, inspection intervals, related inspection procedures and all critical design configuration control limitation for the fuel tank system determined during the Special Federal Aviation Regulation No. 88 program and for

compliance with 14 CFR 25.981 and Special Conditions No. 25.285-SC are listed in the FAA-approved Airworthiness Limitations and Certification Maintenance Requirement, Section 9, of Boeing 747-400 Maintenance Planning Data Document D621U400-9, Revision August 2005 or later FAA-approved revision. All Model 747-400 and -400F series airplanes, production line number 1377 and on, must comply with Revision March 2006, or a later FAA-approved revision. The FAA is planning to issue an airworthiness directive mandating compliance with Revision March 2006, or a later FAA-approved revision, applicable to all Model 747-400 and -400F series airplanes with production numbers lower than 1377.

注释/NOTE 16

包含后续经批准的版本。

Including the subsequent approved version(s).

第 3 部分/SECTION 3: 747-400F

I. 总则/General

1. 型别/Model: 747-400F
2. 适航类别/Airworthiness Category: 运输类航空器/Transport Category Aircraft
3. 型号合格证持有人/Type Certificate Holder: The Boeing Company
1901 Oakesdale Avenue SE, M/C OA1-37
Seattle, WA 98057-2623
4. FAA 批准日期/FAA Approved Date: 1993.10.27/27 Oct 1993
5. CAAC 批准日期/CAAC Approved Date: 2002.08.30/30 Aug 2002

II. 认可审定基础/Validation Certification Basis

CAAC 的认可审定基础由 FAA 的审定基础（详见 FAA 型号合格证数据单：编号 A20WE Rev.32 中的 747-400 型别的审定基础）加上两个等效安全 PS06-0496-F-18、PS08-0670-C-1，和 CAAC 的附加技术条件组成。

PS06-0496-F-18 § 25.1555(d)(1) 发动机和辅助动力装置防火开关手柄设计。

PS08-0670-C-1 § 25.853(a) 内饰板结合处使用的胶黏剂。

The CAAC validation certification basis consists of the FAA certification basis (refer to 747-400 section of FAA Type Certificate Data Sheet No.A20WE, Rev.32) and two Equivalent Safety Findings PS06-0496-F-18、PS08-0670-C-1, and the CAAC additional technical conditions.

PS06-0496-F-18 § 25.1555(d)(1) ELOS Engine and Auxiliary Power Unit (APU) Fire Switch Handle Design.

PS08-0670-C-1 § 25.853(a) for Adhesives Used in Interior Panel Joint Potting Applications.

中国民用航空局附加技术条件/CAAC Additional Technical Conditions.

交付到中国的每一架 747-400F 飞机须满足下述附加技术条件：

Each of Model 747-400F aircraft delivered to China shall meet the following Additional Technical Conditions:

- (1) AR 93001R2 “民用飞机运行仪表和设备要求”

AR 93001R2 "Requirements for Civil Aircraft Operation Instruments and Equipment"

- (2) GB6537-94 “3 号喷气燃料”

GB6537-94 "No. 3 Jet fuel"

III. 技术特征和运行限制 /Technical Characteristics and Operational Limitations

发动机/Engines:

四台普惠公司 PW4000 系列发动机，或 4 台通用电气公司 CF6-80C2B1F，CF6-80C2B5F 发动机。

4 Pratt and Whitney PW4000Series, or 4 General Electric CF6-80C2B1F, CF6-80C2B5F.

PW4000 系列发动机型号合格证编号 E24NE，型号认证编号 VTC0248E，版次 13；CF6-80C2B1F，CF6-80C2B5F 发动机型号合格证编号 E13NE，型号认证编号 TV88009，版次 1。

关于发动机混装，见注释 3。

PW4000 Series engine Type Certificate No. E24NE, VTC No. VTC0248E, Rev. 13. CF6-80C2B1F, CF6-80C2B5F engine Type Certificate No. E13NE; VTC No.

TV88009, Rev.1.

发动机推力限制/Engine Thrust Limits:

发动机型号/ Engine Models:	PW4056	PW4062A	CF6-80C2B1F
推力限制/ Thrust Limits:	56,750 lbs.	62,000 lbs.	57,160 lbs.
起飞, 海平面, 标准天 (5 分钟) 最大连续/Takeoff, Sea Level, Standard Day (5 minutes) Maximum Continuous	47,970 lbs.	47,970 lbs.	49,800 lbs.

燃油/Fuel:

见注释 3。
See Note 3.

空速限制/Airspeed Limits:

$V_{MO}/M_{MO} = 365/0.92$ (KCAS).

对于其它空速限制, 见适用的 FAA 批准的飞机飞行手册。
See the appropriate FAA Approved Airplane Flight Manual for other airspeed limits

重心范围/ C.G. Range:

见适用的 FAA 批准的飞机飞行手册。
See the appropriate FAA approved Airplane Flight Manual.

最大重量/Maximum Weights:

见适用的 FAA 批准的飞机飞行手册。
See the appropriate FAA approved Airplane Flight Manual.

最大行李舱/货舱装载/Maximum Baggage/Cargo:

见重量平衡控制装载手册。
See Weights and Balance Control and Loading Manual.

燃油/滑油量/Fuel/Oil Capacity:

见重量平衡控制装载手册。
See Weights and Balance Control and Loading Manual.

FAA 批准的重量平衡控制装载手册: D043U550。

FAA approved Weights and Balance Control and Loading Manual: D043U550.

FAA 批准的飞机飞行手册: D6U10001, D6U10002 和 D6U10003。

FAA approved Airplane Flight Manual: D6U10001, D6U10002 and D6U10003.

型号/Model	适用的序列号/Eligible Serial Numbers
747-409F	30759-30766
747-412F	26553, 26558-26561, 26563, 28026, 28027, 28030, 28032, 28263
747-428F	25632
747-467F	27175, 27503, 30804, 30805, 32571
747-4B5F	26401, 26406, 26408, 26411, 26413, 26414, 26416, 27073
747-4G4F	30201
747-4R7F	25866, 25867, 25868, 29053, 29729-29733, 30400
747-45EF	30607, 30608
747-46NF	30808-30811

747-47UF 29252-29261, 30558, 30559
747-48EF 25781, 25783, 27603, 28367

发动机限制见 FAA 批准的飞机飞行手册或适用的发动机型号合格证数据单/For engine operating limits see the FAA Approved Airplane Flight Manual or the appropriate engine type certificate data sheet:

普惠/Pratt and Whitney: E24NE
通用电气/General Electric: E13NE

推力设置/Thrust Setting:

必须使用 AFM 第 4 节中适当的 EPR 或 N1 推力设置曲线控制发动机推力。

The appropriate EPR or N1 thrust setting curves in Section 4 of the Airplane Flight Manual (AFM) must be used for control of engine thrust.

最大使用高度/Maximum Operating Altitude:
45100ft.

最小机组/Minimum Crew:

对于所有飞行, 2 人 (机长和副驾驶)。

For all flights, 2 persons (pilot, copilot).

最大载客数/Maximum Passengers:

根据豁免 1870E, 所有 747-400F 飞机人数限制为上层客舱六 (6) 人。

For 747-400F airplanes the total persons capacity is Limited to: Six (6) persons on the upper deck per Exemption 1870E.

所需设备/Required Equipment:

适用的适航规章中所规定的基本所需设备 (见审定基础) 必须安装在审定的飞机上。型号设计数据中说明了所需设备。

The basic required equipment as prescribed in the applicable airworthiness regulations (See Certification Basis) must be installed in the aircraft for certification. The required equipment is noted in the Type Design Data.

基准/Datum:

平衡力臂基准对应于机身 0 站位, 即机头前 90 英寸。所有生产站位数值上保持与力臂一致。基准点距离前起落架顶升点的水平距离为 384.7 英寸。

Balance Arm Datum corresponds to Body Station 0 and is 90 inches forward of nose. All productions stations coincide numerically with arms. Horizontal distance of datum to nose gear jack points is 384.7 inches.

平均气动弦长/MAC:

MAC 长度为 327.8 英寸。MAC 前缘在基准点之后 1258 英寸。

MAC length is 327.8 inches. Leading edge of MAC is 1258 inches aft of datum.

水平测量措施/Leveling Means:

在 BS1444.0 右侧轮舱处, 有吊线锤挂点和水平测量标尺。

A plumb-bob attachment and leveling provision scale are provided in the R.H. body wheel well at BS 1444.0.

控制面运动/Control Surface Movements:

为了保证飞机的正常运行, 必须通过飞行控制系统的正确校装来严格控制各种操纵面的运动。因此, 飞机必须按以下 FAA 批准的文件进行校装:

To insure proper operation of the airplane, the movement of the various control surfaces must be carefully controlled by proper rigging of the flight control systems. The airplane must, therefore, be rigged according to the following

FAA-approved data:

波音图纸编号:

Boeing Drawing Numbers:

251U1001 副翼和扰流板校装说明

251U2001 升降舵校装说明

251U3002 方向舵校装说明

251U4001 安定面配平校装说明

253U5001 校装说明—控制台（包括襟翼控制组件）

256U2001 前缘襟翼控制校装说明

256U3001 后缘襟翼控制校装说明

251U1003 减速板校装说明

251U1001 Rigging Procedures Aileron and Spoiler

251U2001 Rigging Procedures Elevator

251U3002 Rigging Procedures Rudder

251U4001 Rigging Procedures Stabilizer Trim

253U5001 Rigging Procedure - Control Stand (Includes flap control assembly)

256U2001 Rigging Procedures Leading Edge Flaps

256U3001 Rigging Procedures Trailing Edge Flaps

251U1003 Rigging Procedures Speed Brakes

服务信息/ Service Information:

波音报告 D6-34U102 “结构修理手册”是经 FAA 批准的。服务通告和其他服务信息，如经 FAA 批准，将起到同样的作用。

Boeing Report D6-34U102, "Structural Repair Manual," is FAA-approved. Service Bulletins and other Service information, when FAA-approved, will carry a statement to that effect.

审定维修项目/ Certification Maintenance Requirements (CMR's):

CMR 在 FAA 批准的波音公司维修大纲文件 D621U400 第 9 节或者适用的发动机型号合格证数据单中。应以二者中更为严格的要求为准。

The CMR's are listed in either the FAA-approved Section 9 of Boeing Maintenance Planning Data Document D6-21U400 or the applicable engine Type Certificate Data Sheet. The more restrictive requirement from these two documents shall be in force.

生产许可/ Production Basis:

生产许可证编号: 700。

Production Certificate No. 700.

设备 / Equipment:

在适用的适航规章（见审定基础）中规定的基本必备设备，必须安装在审定的飞机上。

The basic required equipment as prescribed in the applicable airworthiness regulations (see Certification Basis) must be installed in the aircraft for certification.

IV. 经批准的中文标记标牌/ The Approved Chinese Placard

以下中文标记标牌已由 CAAC 接受并由 FAA 批准:

The following Chinese Placards have been accepted by CAAC and approved by FAA:

序号 Code	标题 Title	编号 Number	版本（见注释 16） Rev./See Note 16
1	747 Bilingual (Chinese) Placards and Markings	D6-36621-6	C

V. 注释/Notes

注释/NOTE 1: 除非运营人具有经批准的用于重量控制的系统，否则，从飞机首次获得适航证之时起及其以后的所有时间，必须为每架飞机提供一份现行有效的重量和平衡手册（包括审定空重所包含的设备清单）以及装载说明。
A current Weight and Balance Manual including a list of equipment included in the certificated empty weight and loading instructions must be in each aircraft at the time of original airworthiness certification and at all times thereafter except in the case of an operator having an approved weight control system.

注释/NOTE 2: 飞机运行必须依照 FAA 批准的飞机飞行手册。FAA 批准的飞行手册、适用的运行规章或审定基础所要求的所有标牌，必须安装到飞机上。
Airplane operation must be in accordance with the FAA Approved Airplane Flight Manual. All placards required by either the FAA Approved Airplane Flight Manual, the applicable operating rules or the certification basis must be installed in the airplane.

注释/NOTE 3: 普惠公司发动机可使用以下燃油：符合普惠规范 522E 或之后版本的 JP-1, JP-4, 和 JP-5 燃油，如对发动机工作或功率输出没有不利影响，可单独使用或以任何比例混合使用以上燃油。转换不同牌号燃油不需要调整燃油控制。
/The following fuels are eligible for Pratt and Whitney engines: JP-1, JP-4, and JP-5 fuels conforming to the P&WA Specification No. 522E or later revision may be used separately or mixed in any proportion without adversely affecting the engine operation or power output. No fuel control adjustment is required when switching fuel types.

通用电气公司发动机使用符合 GE 规范 D50TF2 的燃油。MIL-T-5624, Grades JP-4 or JP-5, ASTM D1655, Jet A, Jet A1, 和 Jet 8 与该规范一致。【JP-8 也被批准用于 CF6-80C2 系列发动机。】装有件号为 9331M72P33 滴流燃油喷嘴的 CF-80C2 系列发动机禁止使用 JP-4 和 Jet B（宽馏分）燃油。/G.E. engines use fuels conforming to G.E. Spec. D50TF2. MIL-T-5624, Grades JP-4 or JP-5, and ASTM D1655, Jet A, Jet A1, and Jet 8 are consistent with G.E. Specifications. [JP-8 is also approved for use in CF6-80C2 Series engines.] CF-80C2 series engines incorporating Dribble Flow Fuel Nozzles PN9331M72P33, P34 and P41 are prohibited from the use of JP-4 and Jet B (wide cut) fuel.

在已批准燃油中唯一可选的添加剂如下/The only optional additives that may be used in approved fuel are as follows:

- 1) 抗静电剂-Shell ASA3, 浓度不超过 1.0ppm（1.0 克/立方米）/Anti-static additive - Shell ASA3 in concentrations not exceeding 1.0 parts per million (grams per cubic meter).
- 2) 防冰剂- Specification D. Eng. R.D. 2451 (Issue 2) or MIL/1/27686E, 浓度不超过 0.15%（体积浓度）/Anti-icing additive - Specification D. Eng. R.D. 2451 (Issue 2) or MIL/1/27686E in concentrations not exceeding 0.15 percent by volume.
- 3) 防腐剂/润滑剂-可以使用 HITEC E515（先前使用 Santolene C）, 浓度不超过 5 磅/35000 英制加仑, 使得含磷量在 0.07ppm 量级（体积比）/Anti-Corrosion/lubricity additive - HITEC E515 may be used (formerly Santolene C) at a concentration range up to 5 lb. per 35,000 Imperial

gallons, which gives a phosphorus content in the order of 0.07 parts per million.

- 4) 抗微生物添加剂-Biobor JF, 可间歇性加入或不连续加入保持浓度不超过 270 ppm(硼含量 20ppm)。允许消耗掉的燃油中含量不得超过 270 ppm, 且燃油没有被微生物碎片污染。/Anti-microbiological additive - Biobor JF may be used on an intermittent or not-continuous basis at a concentration level not exceeding 270 parts per million (20 ppm Boron). It is permitted to burn off the treated fuel provided the concentration does not exceed 270 ppm, and the fuel is not contaminated by microbial debris.
- 5) 防腐剂/ Corrosion inhibitor additive:
 - a) TOLAD 245-浓度不得超过 12 磅/35000 英制加仑(约 35mg/L)/ TOLAD 245 - in concentrations not exceeding 12 lb. per 35,000 Imperial gallons (approximately 35 mg/L).
 - b) APOLLO PRI 19-浓度不得超过 8 磅/35000 英制加仑(约 23mg/L) / APOLLO PRI 19 - in concentrations not exceeding 8 lb. per 35,000 Imperial gallons (approximately 23 mg/L).
 - c) EMERY 9855-浓度不得超过 12 磅/35000 英制加仑(约 35mg/L) /EMERY 9855 - in concentrations not exceeding 12 lb. per 35,000 Imperial gallons (approximately 35 mg/L).

燃油装载和使用限制在适用于每一个运营人的 FAA 批准的飞行手册中。/Fuel load and usage limitations are contained in the FAA Approved Airplane Flight Manual applicable to each operator.

发动机可使用的滑油如下/The following oils are eligible for the engines:

普惠公司: 符合修订过的普惠规范 521 的合成型/ Pratt & Whitney: Synthetic type conforming to P&WA 521 as revised.

普惠涡轮喷气发动机/P&WA Turbojet Engine

服务通告 238 列出了批准的滑油品牌/Service Bulletin No. 238 lists approved brand oils.

通用电气公司: GE 发动机使用符合 GE 规范 D50TF1 A、B 级的合成型滑油。GE 服务通告 79-1 列出了批准的滑油品牌。/General Electric: G.E. engines use synthetic type oil conforming to G.E. Spec. D50TF1, classes A and B. G.E. Service Bulletin 79-1 lists approved oil brands.

注释/NOTE 4:

限寿件和检查要求/Life Limited Parts and Inspection Requirements:

前起落架/Nose Landing Gear:

前起落架的寿命限制是50,430次着陆。该服役寿命可根据服役航段平均时间修正至飞行小时, 但必须获得FAA批准。/The nose landing gear is life-limited to 50,430 landings. This service life may be corrected to flight hours based on service route segments average times and must be approved by the FAA.

加油扰流板/Refueling Spoiler:

加油扰流板P/N 65B20238限制为20,000空中操作。/Inflight refueling spoiler P/N 65B20238 is limited to 20,000 inflight operations.

逃生系统/Escape System:

由 Olin 公司制造的逃生系统冷气发生器组件, 如果储存在原装(未开封)运输容器或在+10°F 至+90°F 的冷气发生器中, 自生产之日起 6 年内可用。如果冷气发生器组件储存超过 6 年, 不得使用。服役中的冷气发生器组件寿命限制是 3 年。/ Escape system cool gas generator cartridges manufactured by Olin Corporation and stored either in their original (unopened) shipping

canisters or in a cool gas generator between +10°F and +90°F for up to 6 years from date of manufacture are considered serviceable. Cartridges stored for more than 6 years must not be put into service. In service cartridge life is limited to 3 years.

由 Talley 工业制造的逃生系统冷气发生器组件（参考波音服务通告 747-25-2448），其存储限制是自生产之日起 7 年。如果冷气发生器组件储存超过 7 年，不得使用。服役中的冷气发生器组件寿命限制是 3 年。/Escape system cool gas generator cartridges manufactured by Talley Industries (Ref. Boeing Service Bulletin 747-25-2448) have a storage limit of 7 years from the date of manufacture. Cartridges stored for more than 7 years must not be put in service. Inservice cartridge life is limited to 3 years.

逃生系统翼上撤离滑梯门和门解除装置（每架飞机6个）使用15次后必须更换。此外，如果座体内径超出最大图纸公差0.002英寸，也必须更换座体。门解除装置组件超过5个日历年（自生产之日起）时间必须更换。/Escape system off-wing slide door and latch thruster (six each per airplane) must be replaced after 15 firings. In addition, the housing bore must be replaced if the bore is 0.002 inches more than the maximum drawing tolerance. Thruster cartridges must be replaced before 5 years calendar time after date of manufacture.

747-400F 短舱撑杆弹簧梁组件/747-400F Nacelle Strut Spring Beam Assemblies:

以下弹簧梁组件寿命限制为50,000次着陆/The following spring beam assemblies are life limited to 50,000 landings.

发动机安装 Engine Installation	发动机位置 Engine Position	件号 Part Number
GE CF6-80C2 系列	1	311U0050-46 and -48
GE CF6-80C2 Series	4	311U0050-42 and -44
PW 4000 系列	1	311U0050-46 and -48
PW 4000 Series	4	311U0050-50 and -52

发动机吊挂-要求的检查/Engine Pylon - Required Inspections:

除 747-400 飞机以外，对于含有球轴承撑杆梁的所有外侧发动机吊挂，必须每 6,000 飞行小时检查一次轴承卡死情况。747-400 飞机的该检查间隔不能超过 12,500 小时。波音公司维修大纲文件 D6-13747, 或 D621U400 (747-400 飞机) 中给出检查程序或等效的检查程序是可接受的。

All outboard engine pylons incorporating the strut beams with spherical bearings must be inspected for bearing seizure every 6,000 flight hours on all models except for the 747-400 airplane. The inspection interval shall not exceed 12,500 hours for the 747-400 airplane. Inspection procedures specified in Boeing Maintenance Planning Document D6-13747, or D621U400 for the 747-400 airplane, or equivalent are acceptable.

注释/NOTE 5: 在 FAA 批准的飞行手册中适用的限制下，通用电气公司 CF6-50C 发动机可与 CF6-50E 发动机混装。/The General Electric CF6-50C engines may be intermixed with CF6-50E engines with appropriate limitations noted in the FAA Approved Airplane Flight Manual.

注释/NOTE 6: 内开门和固定的短舱唇口的组合可混装，适用的限制信息见 FAA 批准的飞机飞行手册及其适用附。Blow-in door and fixed lip nacelles may be intermixed in the combinations and the appropriate limitations noted in the FAA Approved Airplane Flight Manual and in the appropriate Appendix of the Airplane Flight Manual.

注释/NOTE 7: 要求进行改装以消除对型号审定基础不符合的服务通告在波音公司

D6-30300 “服务通告 747” 中列出。如果进口到美国的飞机按未经 FAA 批准的服务通告进行了改装，则需评估飞机的记录以确认该飞机完成了必要的改装并满足了符合性要求。

There are service bulletins which call for modifications which do not comply with the Type Certification Basis. These service bulletins are listed in Boeing Document D6-30300 titled "Service Bulletin 747". The records of airplanes imported into the USA should be reviewed to be sure that further modifications are accomplished to ensure compliance, if the non FAA-approved service bulletins modifications have been installed.

注释/NOTE 8:

生产线号为 679, 685, 696, 700, 705, 708, 710 及以后的飞机是 1988 年 8 月 20 日之后生产的；生产线号为 804 及后续的飞机是 1990 年 8 月 20 日之后生产的（参见 FAR121.312(a)(1)，修正案 121-198）。生产线号为 805 至 814 的飞机豁免（豁免编号：5176A）。生产线号、序列号和批次号之间的相互关系见波音公司文件 D6-30300 “服务通告 747”。

Airplanes line number 679, 685, 696, 700, 705, 708, 710, and on were manufactured after August 20, 1988, and Airplane line numbers 804 and subsequent were manufactured after August 20, 1990, (Reference FAR 121.312(a)(1) Amendment 121-198). Airplane line numbers 805 through 814 are exempt (Exemption No. 5176A). See Boeing Document D6-30300 titled "Service Bulletin 747" for cross reference of line number to serial number to block number.

注释/NOTE 9:

信息类别定义/Message Category Definitions

1. 警告/Warning: 需要机组立即进行改正或补偿动作的运行或飞机系统状态。/Defined as an operational or aircraft system condition which may require immediate corrective or compensatory action by the crew.
2. 戒备/Cautions: 需要机组立即知晓并随后采取补偿动作的运行或飞机系统状态。/An operational or aircraft system condition which requires immediate crew awareness and prompt compensatory action.
3. 提示/Advisories: 需要机组知晓并可能采取后续补偿措施的运行或飞机系统状态。An operational or aircraft system condition which requires crew awareness for possible future compensatory action.
4. 通知 Memo: 提示机组所选择正常状态的当前情况。/Crew reminders of the current state of selected normal conditions.
5. 状态/Status: 飞机派遣状态的指示。/Indications of airplane's condition for dispatch.
6. FMC 告警/FMC Alerts: 与那些需要机组知晓并可能后续采取补偿措施的 FMC 相关运行状态的提示信息关联。/Associated with advisories - FMC related operational conditions which require crew awareness for possible future compensatory action.
7. CMC 信息/CMC Messages: 飞机故障相关的、详细的（维护层级）信息。/Detailed (maintenance level) messages related to airplane faults.

注释/NOTE 10:

信息、操作、动作和责任 /MESSAGE, OPERATION, ACTION AND RESPONSIBILITY:

信息	责任	运行阶段	快速程度	
			需要知晓	需要动作
警告	飞行员	所有	立即	立即
戒备	飞行员	所有	立即	随后
提示	飞行员	所有	及时	及时*
状态	地勤人员和飞行员	签派	签派	签派之前， 依据 MMEL
FMC 警告	飞行员	所有使用 FMC 的阶段	即时	即时（如需）
FMC 咨询	飞行员	所有使用	即时	即时（如需）

FMC 的阶段

CMC	地勤和 维护人员	签派准备 和检查	CMR 或维护 有要求时	CMR 或 计划维修
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*取决于其他故障、飞行阶段或飞机运行环境

Message	Responsibility	Phase of Operation	How Quickly is:	
			Awareness Req'd	Action Req'd
WARNING	PILOTS	ALL	IMMEDIATE	IMMEDIATE
CAUTIONS	PILOTS	ALL	IMMEDIATE	PROMPT
ADVISORIES	PILOTS	ALL	TIMELY	TIMELY*
STATUS	GROUND CREW AND PILOTS	DISPATCH	DISPATCH	BEFORE DISPATCH, DEPENDS ON MMEL
FMC ALERTS	PILOTS	ALL WHEN USING FMCs	TIMELY	TIMELY (if required)
FMC ADVISORIES	PILOTS	ALL WHEN USING FMCs	TIMELY	TIMELY (if required)
CMC	GROUND CREW & MAINTENANCE	DISPATCH PREPARATION & CHECKS	WHEN REQ'D BY CMR OR MAINTENANCE	CMR OR SCHEDULE A MAINTENANCE

*Depends on other failures, phase of flight or context of operation of airplane.

注释/NOTE 11: 波音 747 补充结构检查文件 D6-35022 (见 AD 84-21-02, 版本 39-4936) 将在 FAA 工程人员确定的时间内进行修订以包含 747-400F。
The Boeing 747 Supplemental Structural Inspection Document D6-35022 (See AD 84-21-02, Amendment 39-4936) will be revised to include the 747-400F at a time to be determined by FAA engineering.

注释/NOTE 12: 747-400F 的 E 级货舱需要安装满足 25 部 (修正案 25-26) 附录 F 第三部分要求的全尺寸耐火衬垫。该要求在问题纪要 SE-1 “E 级货舱内关键系统和设备的防护” (第 4 阶段, 1993 年 10 月 13 日发布) 中列出。
The class E cargo compartment on the 747-400F is required to be fitted with a full fire resistant liner which meets the requirement of Part 25 Appendix F, Part III at Amendment 25-60. This requirement is documented in Issue Paper SE-1, Stage 4, dated October 14, 1993, titled Protection of Critical Systems and Equipment within Class E Cargo Compartments.

注释/NOTE 13: 波音生产线号为 1047 及以后的飞机在生产过程中已贯彻了 747 吊挂改装项目。吊挂到机翼的连接结构符合以下修正案水平的 FAR 审定基础/Boeing production line numbers 1047 and on have incorporated the 747 strut modification program in the production sequence. The certification basis for the strut-to-wing attachment structure complies with the following FAR's at the upgraded amendment levels listed below:

规章条款	条款名称	修正案水平
25.301, 25.303, 25.307	总则-结构	78
25.305	强度和变形	54
25.321 至 25.563	载荷工况	78
25.571	损伤容限	45
25.581 至 25.625	设计和构造	78
25.629	气动弹性稳定性	78

FAR(s)	Subject	Amendment Level
25.301, 25.303, 25.307	General Structure	78
25.305	Strength and Deformation	54
25.321 through 25.563	Load Conditions	78
25.571	Damage Tolerance	45
25.581 through 25.625	Design and Construction	78
25.629	Aerodynamic Stability	78

注释/NOTE 14: 已删除。/Deleted.

注释/NOTE 15: 对于 747-400 和 -400F 系列飞机: 在 SFAR88 项目期间以及表明对

14CFR25.981 和专用条件 25.285-SC 符合性时所确定的关于燃油箱系统的强制更换时间、检查间隔、相关检查程序和所有关键设计构型控制限制，均列在 FAA 批准的波音 747-400 维修大纲文件 D621U400-9（版本：2005 年 8 月或之后 FAA 批准的版本）第 9 节“适航限制和审定维修要求”中。生产线号为 1377 及之后的 747-400 和-400F 系列飞机，必须符合 D621U400-9（2006 年 3 月或之后 FAA 批准的版本）。FAA 计划发布一份适航指令强制符合 D621U400-9（2006 年 3 月或之后 FAA 批准的版本）的要求，适用于所有生产线号小于 1377 的 747-400 和-400F 系列飞机。

For Model 747-400 and -400F series airplanes: Mandatory replacement times, inspection intervals, related inspection procedures and all critical design configuration control limitation for the fuel tank system determined during the Special Federal Aviation Regulation No. 88 program and for compliance with 14 CFR 25.981 and Special Conditions No. 25.285-SC are listed in the FAA-approved Airworthiness Limitations and Certification Maintenance Requirement, Section 9, of Boeing 747-400 Maintenance Planning Data Document D621U400-9, Revision August 2005 or later FAA-approved revision. All Model 747-400 and -400F series airplanes, production line number 1377 and on, must comply with Revision March 2006, or a later FAA-approved revision. The FAA is planning to issue an airworthiness directive mandating compliance with Revision March 2006, or a later FAA-approved revision, applicable to all Model 747-400 and -400F series airplanes with production numbers lower than 1377.

注释/NOTE 16:

包含后续经批准的版本。
Including the subsequent approved version(s).

第 4 部分/SECTION 4: 747-8F

I. 总则/General

1. 型别/Model: 747-8F
2. 适航类别/Airworthiness Category: 运输类航空器/Transport Category Aircraft
3. 型号合格证持有人/Type Certificate Holder: The Boeing Company
1301 Second Avenue
Seattle, Washington 98101
4. FAA 批准日期/FAA Approved Date: 2011.08.19/19 Aug 2011
5. CAAC 批准日期/CAAC Approved Date: 2014.0919/19 Sep 2014

II. 认可审定基础/Validation Certification Basis

CAAC 的认可审定基础由 FAA 的审定基础（详见 FAA 型号合格证数据单：编号 A20WE Rev.54 中的 747-8F 型别的审定基础，除 14 CFR 25.1457(d)(5)(i)和 25.1457(d)(5)(ii)外）加上两个等效安全：PS06-0496-F-18、PS08-0670-C-1，豁免 10477 和 CAAC 的附加技术条件组成。

PS06-0496-F-18 §25.1555(d)(1) 发动机和辅助动力装置防火手柄设计的等效安全。

PS08-0670-C-1 §25.853(a) 内饰板结合处使用的胶黏剂。

豁免 10477，25.981(a)(3) 25-102 修正案, 747-8 /-8F 水平安定面燃油箱结构闪电防护。

The CAAC validation certification basis consists of the FAA certification basis (refer to FAA Type Certificate Data Sheet No.T00021SE Rev.54, except 14 CFR 25.1457(d)(5)(i), 25.1457(d)(5)(ii)), and the two ELOS PS06-0496-F-18, PS08-0670-C-1, exemption 10477 and the CAAC additional technical conditions.

PS06-0496-F-18 §25.1555(d)(1) ELOS Engine and Auxiliary Power Unit (APU) Fire Switch Handle Design.

PS08-0670-C-1 § 25.853(a) for Adhesives Used in Interior Panel Joint Potting Applications.

Exemption 10477, 25.981(a)(3) at amendment 25-102, 747-8 /-8F Horizontal Stabilizer Fuel Tank Structural Lightning Protection.

CCAR-26《运输类飞机的持续适航与安全改进》：适用条款已包括在审定基础中，对于 CCAR-26 的任何修订，本 VTC 持有人必须证明对适用条款的符合性。

CCAR-26 – Continued Airworthiness and Safety Improvements for Transport Category Airplanes: applicable provisions of Part 26 have been included in the certification basis. For any future Part 26 amendments, the holder of this TC must demonstrate compliance with the applicable sections.

民航发[2012]30 号文《关于运输类飞机点火源防护追溯要求的通知》的要求已包括在审定基础中。

The requirements of Civil Aviation Order – Retrospective Requirements for Transport Category Airplane Ignition Sources Prevention (CAO No 2012-30) have been included in the certification basis.

中国民用航空局附加技术条件/CAAC Additional Technical Conditions.

交付到中国的每一架 747-8F 飞机须满足下述附加技术条件：

Each of Model 747-8F aircraft delivered to China shall meet the following Additional Technical Conditions:

- (1) 必须符合 FAA 颁布的所有适用的适航指令；

All applicable airworthiness directives (ADs) issued by the FAA shall be complied with.

- (2) 在每一航空器上必须安装快速存储器（QAR）（参照中国适航指令 CAD-97-MULT-38）；

Quick Access Recorder (QAR) must be installed on each aircraft (reference to CAD97-MULT-38).

- (3) 高度测量组件应至少采用米制高度显示（参照 CCAR 121.301(d)）；

The altimeter measure unit shall be indicated in meter at least (reference to CCAR

121.301(d)).

- (4) 必须确定符合“GB6537-2006 3 号喷气燃料”规范的燃料的可接受性;
The acceptance of fuel conforming the Specification GB6537-2006 “No.3 Jet Fuel” must be defined.
- (5) 厕所垃圾箱灭火器所使用的灭火剂的要求 (参照 CAAC 适航指令 CAD2012-MULT-09);
The requirements about lavatory disposal receptacle Fire Extinguishing agent (reference to CAAC Airworthiness Directive CAD2012-MULT-09).
- (6) 标牌要求/Placard Requirements:
 - (a) 根据 CCAR 21.29(5), 有关适航规章、噪声规定所要求的手册、标牌、目录清单和仪表标记应当用中文或者英文书写, 下列各项应当至少有中文表述: /Per CCAR 21.29(5), the manuals, placards, listings and instrument markings required by the applicable airworthiness regulations and noise requirements are presented in the Chinese or English language. The following items must be presented in Simplified Chinese at least:
 - 1) 机上所有对旅客进行的提示、警告和通知的文字标记和标牌; / All on-board placard and marking for awareness, warning, and note to the passenger;
 - 2) 机上所有向旅客或者机外营救人员指示应急出口和门的位置以及开启方法的文字标记和标牌; /All on-board placard and marking for opening method and location indication of the emergency exit and door to passenger and outside rescuer; and
 - 3) 旅客可能使用的机上所有应急设备的操作、使用说明。/All operational instructions for on-board emergency equipment possible operated by passengers shall be presented in Simplified Chinese at least.
 - (b) 中文字符的尺寸需符合 CCAR 25.811(e)(4)(iii)和 CCAR25.812 的要求。/ The dimension of the Chinese characters shall comply with the provision of the CCAR 25.811 (e) (4) (iii) and CCAR 25.812 as applicable.
 - (c) 所有中文手册、标牌、目录清单和仪表标记必须表达正确。/All of the manuals, placards and marking, listings and instrument markings presented in the Chinese must be correct.

III. 技术特征和运行限制 /Technical Characteristics and Operational Limitations

发动机/Engines:

四台通用电气公司的涡扇发动机; 型号: GEnx-2B67, GEnx-2B67B, GEnx-2B67/P (发动机型号合格证编号: E00078NE, 发动机型号认证编号: VTC0271E, 版次 4)。

警告: 为避免不安全的飞机操纵特性, 同一架飞机上的电子发动机控制器 (EEC) 软件 C060 版 (或更高版本) 不可与 C032, C040 或 C045 版本混装。因为 GE C060 软件与 EEC 软件的早期版本相比, 其慢车选择逻辑不同。如果 C060 版 EEC 软件与早期 EEC 软件版本混装, 在从低功率加速时, 该差异可造成不安全的较大不平衡推力 (如: 一台或多台发动机在较高慢车功率, 而其他发动机处于最低慢车功率。处于较高慢车功率的发动机对于快推油门杆动作的响应更加迅速)。见波音服务通告 747-73A2083。

关于发动机混装, 见注释 4。

4 General Electric Turbofan Engines Model: GEnx-2B67, GEnx-2B67B, GEnx-2B67/P (Engine Type Certificate No. E00078NE, Engine Validation Type Certificate No. VTC0271E, Rev.4).

WARNING: To prevent unsafe airplane handling characteristics, electronic engine control (EEC) software C060 (or newer) cannot be intermixed on the same aircraft with older EEC software: C032, C040, or C045. The idle selection logic is different in GE C060 software compared to older versions of EEC software. This difference can potentially provide large unsafe thrust asymmetries during acceleration from lower power if C060 EEC software is mixed with older EEC software (i.e. one or more engine at a high idle, while the rest are at minimum idle. The engines at high idle will respond much quicker if there is a rapid throttle advance). See Boeing Service Bulletin 747-73A2083.

SEE Note 4, regarding intermixing of Engines.

燃油/Fuel:

通用电气公司的涡扇发动机:

符合如下规范的燃油为可接受:

ASTM D-1655 grades Jet-A 和 Jet A-1

MIL-DTL-5624 grade JP-5

MIL-DTL-83133 grade JP-8

GB6537-2006 3 号喷气燃料 (见注释 5)

按照其它规范生产且特性满足上述规范要求的燃油可以接受。燃油和燃油添加剂必须符合相关的发动机使用说明书。

General Electric Turbofan Engines:

Fuels conforming to:

ASTM D-1655 grades Jet-A and Jet A-1

MIL-DTL-5624 grade JP-5

MIL-DTL-83133 grade JP-8

GB6537-2006 No.3 Jet Fuel (See Note 5).

Fuels produced to other specifications and having properties meeting the requirements of the above specifications are acceptable. The fuel and any fuel additives must conform to the relevant Engine Operating Instructions.

发动机限制/Engine Limits:

通用电气公司的涡扇发动机

发动机功率见 FAA 批准的飞机飞行手册。

General Electric Turbofan Engines

See the FAA approved Airplane Flight Manual for engine ratings.

空速限制/Airspeed Limits:

$V_{MO}/M_{MO} = 365/0.9$ (KCAS).

对于其它空速限制, 见适用的 FAA 批准的飞机飞行手册。

See the appropriate FAA Approved Airplane Flight Manual for other airspeed limits.

重心范围/ CG Range: 见适用的 FAA 批准的飞机飞行手册。

See the appropriate FAA-approved Airplane Flight Manual.

空重重心/Empty Weight C.G.:

见适用的 FAA 批准的飞机飞行手册。

See the appropriate FAA-approved Airplane Flight Manual.

基准/Datum:

见重量和平衡手册。

See Weights and Balance Manual.

水平测量措施/Leveling Means:

见 FAA 批准的飞机飞行手册。

See FAA-approved Airplane Flight Manual.

最大重量/Maximum Weights:

见适用的 FAA 批准的飞机飞行手册。

See the appropriate FAA-approved Airplane Flight Manual.

最小机组/Minimum Crew:

二（2）人：机长和副驾驶。
Two (2) persons: pilot and copilot.

座位数/Number of Seats:

最大八（8）人，包括飞行机组。根据豁免 9793C 和 FAA 批准的飞机飞行手册中的限制。

Maximum of eight (8) persons including the flight crew per exemption 9793C and limitations outlined in the FAA approved Airplane Flight Manual.

最大载货量/Maximum Compartment Weights:

见重量和平衡手册。

See Weights and Balance Manual.

燃油量/Fuel Capacity:

见重量和平衡手册。

See Weights and Balance Manual.

滑油量/Oil Capacity:

见重量和平衡手册。

See Weights and Balance Manual.

最大使用高度/Maximum Operating Altitude:

42100ft.

控制面运动/Control Surface Movements:

为了保证飞机的正常运行，必须通过飞行控制系统的正确校装来严格控制各种操纵面的运动。因此，飞机必须按以下 FAA 批准的文件进行校装：

To insure proper operation of the airplane, the movement of the various control surfaces must be carefully controlled by proper rigging of the flight control systems. The airplane must, therefore, be rigged according to the following FAA-approved data:

波音图纸编号：

Boeing Drawing Numbers:

251U1001 横向控制校装说明

251U1003 减速板校装说明

251U2001 升降舵控制校装说明

251U3002 方向舵控制校装说明

251U4001 安定面配平控制校装说明

114U0001 前缘缝翼控制校装说明

253U5001 控制台校装说明

256U5001 后缘襟翼控制校装说明

251U1001 Rigging Instructions Lateral Controls

251U1003 Rigging Instructions Speed Brakes

251U2001 Rigging Instructions Elevator Controls

251U3002 Rigging Instructions Rudder Controls

251U4001 Rigging Instructions Stabilizer Trim Controls

114U0001 Rigging Instructions Leading Edge Slats Controls

253U5001 Rigging Instructions Control Stand

256U5001 Rigging Instructions Trailing Edge Flap Controls

生产许可/ Production Basis:

波音公司获得生产许可证编号：700。

Production Certificate No. 700 has been issued to The Boeing Company.

设备 / Equipment:

在适用的适航规章（见审定基础）中规定的基本必备设备，必须安装在审定的飞机上。

The basic required equipment as prescribed in the applicable airworthiness regulations (see Certification Basis) must be installed in the aircraft for certification.

IV.经批准的中文标记标牌/ The Approved Chinese Placard

以下中文标记标牌已由 CAAC 接受并由 FAA 批准:

The following Chinese Placards have been accepted by CAAC and approved by FAA:

序号 Code	标题 Title	编号 Number	版本（见注释 6） Rev./See Note 6
1	747 Bilingual (Chinese) Placards and Markings	D6-36621-6	C

V. 注释/Notes

注释/NOTE 1:

除非运营人具有经 FAA 批准的用于重量控制的系统，否则，从飞机首次获得适航证之时起及其以后的所有时间，必须为每架飞机提供一份现行有效的重量和平衡手册（包括审定空重所包含的设备清单）以及装载说明。

A current Weight and Balance Manual including a list of equipment included in the certificated empty weight and loading instructions must be in each aircraft at the time of original airworthiness certification and at all times thereafter except in the case of an operator having an approved weight control system.

注释/NOTE 2:

飞机运行必须依照 FAA 批准的飞机飞行手册。FAA 批准的飞行手册、适用的运行规章或审定基础所要求的所有标牌，必须安装到飞机上。

Airplane operation must be in accordance with the FAA Approved Airplane Flight Manual. All placards required by either the FAA Approved Airplane Flight Manual, the applicable operating rules or the certification basis must be installed in the airplane.

注释/NOTE 3:

维修大纲（波音公司文件 D011U721-02）第 9 节-适航限制和审定维修要求中引用了 FAA 批准的持续适航文件适航限制章节。适航限制章节经过 FAA 批准且规定了 14CFR43.16 和 91.403 所要求的维护活动，除非 FAA 批准了替代的项目。以下是 FAA 批准用来表明符合 14CFR 25.1529, 43.16 和 91.403 要求的文件。

The FAA approved Airworthiness Limitations Section of the Instructions for Continued Airworthiness are referenced in Maintenance Planning Data Document (MPD) Section 9 - Airworthiness Limitations and Certification Maintenance Requirements; Boeing Document D011U721-02. The Airworthiness Limitations section is FAA-approved and specifies maintenance required under 14 CFR 43.16 and 91.403 of the Federal Aviation Regulations, unless an alternative program has been FAA approved. The following documents are the FAA approved requirements to comply with 14 CFR 25.1529, 43.16 and 91.403:

D011U721-02-01, 747-8/8F 适航限制（AWLs）

D011U721-02-02, 747-8/8F 适航限制 (AWLs) -针对特定的生产线号
D011U721-02-03, 747-8/8F 审定维护要求 (CMR)
D011U721-02-04, 747-8/8F 747 特殊符合性项目 (SCI) /适航限制
D011U721-02-01, 747-8/8F Airworthiness Limitations (AWLs)
D011U721-02-02, 747-8/8F Airworthiness Limitations (AWLs) - Line No. Specific
D011U721-02-03, 747-8/8F Certification Maintenance Requirements (CMRs)
D011U721-02-04, 747-8/8F Special Compliance Items (SCIs)/Airworthiness Limitations

注释/NOTE 4: 允许根据 FAA 批准的方法混装 GEnx-2B67, GEnx-2B67B 和 GEnx-2B67/P 发动机。
Engine Intermix of GEnx-2B67, GEnx-2B67B and GEnx-2B67/P engines is allowed in accordance with a method approved by the FAA.

注释/NOTE 5: 批准使用以下中国燃油/The following Chinese fuels are approved for use:

1. 满足中国 GB6537-2006 规范要求的燃油。/Fuels that meet the requirements in the Chinese GB6537-2006 Specification.
2. 批准按 GB6537-2006 规范中规定的浓度使用以下添加剂/The following additives in the GB6537-2006 Specification are approved for use at the concentration specified in the specification.
 - (1). 抗静电剂/Static Dissipater Additive: Statis 450.
 - (2). 抗氧/Antioxidant: 2,6-ditertiary-butyl-4-methyl-phenol.
 - (3). 防冰剂/Icing Inhibitor: Diethylene glycol monomethyl ether.
 - (4). 金属钝化剂/Metal Deactivator Additive: N, N'-disalicylidene-1, 2-propanediamine.

抗静电剂 T1502、防冰剂 ethylene glycol monomethylether 及抗磨剂 T1601、T1602 未被批准使用。/Static dissipater additive T1502, anti-icing additive ethylene glycol monomethylether and antifriction additives T1601, and T1602 are not approved for use.

注释/NOTE 6: 包含后续经批准的版本。
Including the subsequent approved version(s).

第 5 部分/SECTION 5: 747-8

I. 总则/General

- | | |
|--------------------------------------|--|
| 1. 型别/Model: | 747-8 |
| 2. 适航类别/Airworthiness Category: | 运输类航空器/Transport Category Aircraft |
| 3. 型号合格证持有人/Type Certificate Holder: | The Boeing Company
1901 Oakesdale Avenue SW
Seattle, WA 98057-2623 |
| 4. FAA 批准日期/FAA Approved Date: | 2011.12.14/14 Dec 2011 |
| 5. CAAC 批准日期/CAAC Approved Date: | 2014.09.19/19 Sep 2014 |

II. 认可审定基础/Validation Certification Basis

CAAC的认可审定基础由FAA的审定基础（详见FAA型号合格证数据单：编号A20WE Rev.54中的747-8型别的审定基础除14 CFR 25.1457(d)(5)(i)和25.1457(d)(5)(ii)以外）加上两个等效安全：PS06-0496-F-18、PS08-0670-C-1；豁免10477；FAA ETOPS型号设计批准（见注释7）和CAAC的附加技术条件组成。

PS06-0496-F-18 §25.1555(d)(1) 发动机和辅助动力装置防火手柄设计的等效安全。

PS08-0670-C-1 §25.853(a) 内饰板结合处使用的胶黏剂。

豁免10477，25.981(a)(3) 25-102修正案, 747-8 /-8F水平安定面燃油箱结构闪电防护。

The CAAC validation certification basis consists of the FAA certification basis (refer to FAA Type Certificate Data Sheet No.T00021SE Rev.54, except 14 CFR 25.1457(d)(5)(i), 25.1457(d)(5)(ii)), and the two ELOS PS06-0496-F-18, PS08-0670-C-1, exemption 10477, FAA ETOPS Type Design Approval (see Note 7) and the CAAC additional technical conditions.

PS06-0496-F-18 §25.1555(d)(1) ELOS Engine and Auxiliary Power Unit (APU) Fire Switch Handle Design.

PS08-0670-C-1 § 25.853(a) for Adhesives Used in Interior Panel Joint Potting Applications.

Exemption 10477, 25.981(a)(3) at amendment 25-102, 747-8 /-8F Horizontal Stabilizer Fuel Tank Structural Lightning Protection.

CCAR-26《运输类飞机的持续适航与安全改进》：适用条款已包括在审定基础中，对于 CCAR-26的任何修订，本 VTC 持有人必须证明对适用条款的符合性。

CCAR-26 – Continued Airworthiness and Safety Improvements for Transport Category Airplanes: applicable provisions of Part 26 have been included in the certification basis. For any future Part 26 amendments, the holder of this VTC must demonstrate compliance with the applicable sections.

民航发[2012]30 号文《关于运输类飞机点火源防护追溯要求的通知》的要求已包括在审定基础中。

The requirements of Civil Aviation Order – Retrospective Requirements for Transport Category Airplane Ignition Sources Prevention (CAO No 2012-30) have been included in the certification basis.

中国民用航空局附加技术条件/CAAC Additional Technical Conditions.

交付到中国的每一架 747-8 飞机须满足下述附加技术条件：

Each of Model 747-8 aircraft delivered to China shall meet the following Additional Technical Conditions:

- (1) 必须符合 FAA 颁布的所有适用的适航指令；

All applicable airworthiness directives (ADs) issued by the FAA shall be complied with.

- (2) 在每一航空器上必须安装快速存储器（QAR）（参照中国适航指令 CAD-97-MULT-38）；

Quick Access Recorder (QAR) must be installed on each aircraft (reference to CAD97-MULT-38).

- (3) 高度测量组件应至少采用米制高度显示（参照 CCAR 121.301(d)）；
The altimeter measure unit shall be indicated in meter at least (reference to CCAR 121.301(d)).
- (4) 必须确定符合“GB6537-2006 3 号喷气燃料”规范的燃料的可接受性；
The acceptance of fuel conforming the Specification GB6537-2006 “No.3 Jet Fuel” must be defined.
- (5) 厕所垃圾箱灭火器所使用的灭火剂的要求（参照 CAAC 适航指令 CAD2012-MULT-09）；
The requirements about lavatory disposal receptacle Fire Extinguishing agent (reference to CAAC Airworthiness Directive CAD2012-MULT-09).
- (6) 标牌要求/Placard Requirements :
 - (a) 根据 CCAR 21.29(5)，有关适航规章、噪声规定所要求的手册、标牌、目录清单和仪表标记应当用中文或者英文书写，下列各项应当至少有中文表述：/Per CCAR 21.29(5), the manuals, placards, listings and instrument markings required by the applicable airworthiness regulations and noise requirements are presented in the Chinese or English language. The following items must be presented in Simplified Chinese at least:
 - 1) 机上所有对旅客进行的提示、警告和通知的文字标记和标牌；/ All on-board placard and marking for awareness, warning, and note to the passenger;
 - 2) 机上所有向旅客或者机外营救人员指示应急出口和门的位置以及开启方法的文字标记和标牌；/All on-board placard and marking for opening method and location indication of the emergency exit and door to passenger and outside rescuer; and
 - 3) 旅客可能使用的机上所有应急设备的操作、使用说明。/All operational instructions for on-board emergency equipment possible operated by passengers shall be presented in Simplified Chinese at least.
 - (b) 中文字符的尺寸需符合 CCAR 25.811(e)(4)(iii)和 CCAR25.812 的要求。/ The dimension of the Chinese characters shall comply with the provision of the CCAR 25.811 (e) (4) (iii) and CCAR 25.812 as applicable.
 - (c) 所有中文手册、标牌、目录清单和仪表标记必须表达正确。/All of the manuals, placards and marking, listings and instrument markings presented in the Chinese must be correct.

III. 技术特征和运行限制 /Technical Characteristics and Operational Limitations

发动机/Engines:

四台通用电气公司的涡扇发动机；型号：GEnx-2B67, GEnx-2B67B, GEnx-2B67/P（发动机型号合格证编号：E00078NE，发动机型号认证编号：VTC0271E，版次 4）。

警告：为避免不安全的飞机操纵特性，同一架飞机上的电子发动机控制器（EEC）软件 C060 版（或更高版本）不可与 C032, C040 或 C045 版本混装。因为 GE C060 软件与 EEC 软件的早期版本相比，其慢车选择逻辑不同。如果 C060 版 EEC 软件与早期 EEC 软件版本混装，在从低功率加速时，该差异可造成不安全的较大不平衡推力（如：一台或多台发动机在较高慢车功率，而其他发动机处于最低慢车功率。处于较高慢车功率的发动机对于快推油门杆动作的响应更加迅速）。见波音服务通告 747-73A2083。

关于发动机混装，见注释 4。

4 General Electric Turbofan Engines Model: GEnx-2B67, GEnx-2B67B, GEnx-2B67/P (Engine Type Certificate No. E00078NE, Engine Validation Type Certificate No. VTC0271E, Rev.4).

WARNING: To prevent unsafe airplane handling characteristics, electronic engine control (EEC) software C060 (or newer) cannot be intermixed on the same aircraft with older EEC software: C032, C040, or C045. The idle selection logic is different in GE C060 software compared to older versions of EEC software. This difference can potentially provide large unsafe thrust asymmetries during acceleration from lower power if C060 EEC software is

mixed with older EEC software (i.e. one or more engine at a high idle, while the rest are at minimum idle. The engines at high idle will respond much quicker if there is a rapid throttle advance). See Boeing Service Bulletin 747-73A2083. SEE Note 4, regarding intermixing of Engines.

燃油/Fuel:

通用电气公司的涡扇发动机:

符合如下规范的燃油为可接受:

ASTM D-1655 grades Jet-A 和 Jet A-1

MIL-DTL-5624 grade JP-5

MIL-DTL-83133 grade JP-8

GB6537-2006 3 号喷气燃料 (见注释 5)

按照其它规范生产且特性满足上述规范要求的燃油可以接受。燃油和燃油添加剂必须符合相关的发动机使用说明书。

General Electric Turbofan Engines:

Fuels conforming to:

ASTM D-1655 grades Jet-A and Jet A-1

MIL-DTL-5624 grade JP-5

MIL-DTL-83133 grade JP-8

GB6537-2006 No.3 Jet Fuel (See Note 5).

Fuels produced to other specifications and having properties meeting the requirements of the above specifications are acceptable. The fuel and any fuel additives must conform to the relevant Engine Operating Instructions.

发动机限制/Engine Limits:

通用电气公司的涡扇发动机

发动机功率见 FAA 批准的飞机飞行手册。

General Electric Turbofan Engines

See the FAA approved Airplane Flight Manual for engine ratings.

空速限制/Airspeed Limits:

$V_{MO}/M_{MO} = 365/0.9$ (KCAS).

对于其它空速限制, 见适用的 FAA 批准的飞机飞行手册。

See the appropriate FAA Approved Airplane Flight Manual for other airspeed limits

重心范围/ CG Range: 见适用的 FAA 批准的飞机飞行手册。

See the appropriate FAA-approved Airplane Flight Manual.

空重重心/Empty Weight C.G.:

见适用的 FAA 批准的飞机飞行手册。

See the appropriate FAA-approved Airplane Flight Manual.

基准/Datum:

见重量和平衡手册。

See Weights and Balance Manual.

水平测量措施/Leveling Means:

见 FAA 批准的飞机飞行手册。

See FAA-approved Airplane Flight Manual.

最大重量/Maximum Weights:

见适用的 FAA 批准的飞机飞行手册。

See the appropriate FAA-approved Airplane Flight Manual.

最小机组/Minimum Crew:

二（2）人：机长和副驾驶。

Two (2) persons: pilot and copilot.

座位数/Number of Seats:

605 乘客：主客舱人数限制为 495 人（当构型为主客舱有四组 A 类出口，且 1 号门处为一组 C 类出口时）

主客舱人数限制为 440 人（当构型为主客舱有三组 A 类出口，且 1 号和 5 号门处为两组 C 类出口时）

上层客舱人数限制为 110 人（当构型为一组 A 类出口时）

上层客舱人数限制为 45 人（当根据其内饰构型，上层客舱出口定级为 I 类时）

上层客舱人数限制为 55 人（当根据其内饰构型，上层客舱出口定级为 C 类时）

605 passengers: Main Deck limited to 495 (when configured with 4 pairs of Type "A" exits on the main deck and one pair of Type "C" exits at Door 1)

Main Deck Limited to 440 (when configured with three pairs of Type "A" exits and two pair of Type "C" exits at Doors 1 and 5)

Upper Deck limited to 110 (when configured with one pair of Type A exits.)

Upper Deck limited to 45 (when upper deck exits are rated as Type I due to the interior configuration.)

Upper Deck limited to 55 (when upper deck exits are rated as Type C due to the interior configuration.)

最大载货量/Maximum Compartment Weights:

见重量和平衡手册。

See Weights and Balance Manual.

燃油量/Fuel Capacity:

见重量和平衡手册。

See Weights and Balance Manual.

滑油量/Oil Capacity:

见重量和平衡手册。

See Weights and Balance Manual.

最大使用高度/Maximum Operating Altitude:

43100ft

控制面运动/Control Surface Movements:

为了保证飞机的正常运行，必须通过飞行控制系统的正确校装来严格控制各种操纵面的运动。因此，飞机必须按以下 FAA 批准的文件进行校装：

To insure proper operation of the airplane, the movement of the various control surfaces must be carefully controlled by proper rigging of the flight control systems. The airplane must, therefore, be rigged according to the following FAA-approved data:

波音图纸编号：

Boeing Drawing Numbers:

251U1001 横向控制校装说明

251U1003 减速板校装说明

251U2001 升降舵控制校装说明

251U3002 方向舵控制校装说明

251U4001 安定面配平控制校装说明

114U0001 前缘缝翼控制校装说明

253U5001 控制台校装说明
256U5001 后缘襟翼控制校装说明

251U1001 Rigging Instructions Lateral Controls
251U1003 Rigging Instructions Speed Brakes
251U2001 Rigging Instructions Elevator Controls
251U3002 Rigging Instructions Rudder Controls
251U4001 Rigging Instructions Stabilizer Trim Controls
114U0001 Rigging Instructions Leading Edge Slats Controls
253U5001 Rigging Instructions Control Stand
256U5001 Rigging Instructions Trailing Edge Flap Controls

生产许可/ Production Basis:

波音公司获得生产许可证编号：700。
Production Certificate No. 700 has been issued to The Boeing Company.

设备 / Equipment:

在适用的适航规章（见审定基础）中规定的基本必备设备，必须安装在审定的飞机上。
The basic required equipment as prescribed in the applicable airworthiness regulations (see Certification Basis) must be installed in the aircraft for certification.

IV.经批准的中文标记标牌/ The Approved Chinese Placard

以下中文标记标牌已由 CAAC 接受并由 FAA 批准：

The following Chinese Placards have been accepted by CAAC and approved by FAA:

序号 Code	标题 Title	编号 Number	版本（见注释 6） Rev./See Note 6
1	747 Bilingual (Chinese) Placards and Markings	D6-36621-6	C

V.注释/Notes

- 注释/NOTE 1: 除非运营人具有经 FAA 批准的用于重量控制的系统，否则，从飞机首次获得适航证之时起及其以后的所有时间，必须为每架飞机提供一份现行有效的重量和平衡手册（包括审定空重所包含的设备清单）以及装载说明。
A current Weight and Balance Manual including a list of equipment included in the certificated empty weight and loading instructions must be in each aircraft at the time of original airworthiness certification and at all times thereafter except in the case of an operator having an approved weight control system.
- 注释/NOTE 2: 飞机运行必须依照 FAA 批准的飞机飞行手册。FAA 批准的飞行手册、适用的运行规章或审定基础所要求的所有标牌必须安装到飞机上。
Airplane operation must be in accordance with the FAA Approved Airplane Flight Manual. All placards required by either the FAA Approved Airplane Flight Manual, the applicable operating rules or the certification basis must be installed in the airplane.
- 注释/NOTE 3: 维修大纲（波音公司文件 D011U721-02）第 9 节-适航限制和审定维修要求中引用了 FAA 批准的持续适航文件适航限制章节。适航限制章节经过 FAA 批准且规定了 14CFR 43.16 和 91.403 所要求的维护活动，除非 FAA 批准了替代的

项目。以下是 FAA 批准用来表明符合 14CFR25.1529, 43.16 和 91.403 要求的文件。

The FAA approved Airworthiness Limitations Section of the Instructions for Continued Airworthiness are referenced in Maintenance Planning Data Document (MPD) Section 9 - Airworthiness Limitations and Certification Maintenance Requirements; Boeing Document D011U721-02. The Airworthiness Limitations section is FAA-approved and specifies maintenance required under 14 CFR 43.16 and 91.403 of the Federal Aviation Regulations, unless an alternative program has been FAA approved. The following documents are the FAA approved requirements to comply with 14 CFR 25.1529, 43.16 and 91.403:

D011U721-02-01, 747-8/8F 适航限制 (AWLs)

D011U721-02-02, 747-8/8F 适航限制 (AWLs) -针对特定的生产线号

D011U721-02-03, 747-8/8F 审定维护要求 (CMR)

D011U721-02-04, 747-8/8F 747 特殊符合性项目 (SCI) /适航限制

D011U721-02-01, 747-8/8F Airworthiness Limitations (AWLs)

D011U721-02-02, 747-8/8F Airworthiness Limitations (AWLs) - Line No. Specific

D011U721-02-03, 747-8/8F Certification Maintenance Requirements (CMRs)

D011U721-02-04, 747-8/8F Special Compliance Items (SCIs)/Airworthiness Limitations

注释/NOTE 4:

允许根据 FAA 批准的方法混装 GENx-2B67, GENx-2B67B 和 GENx-2B67/P 发动机。

Engine Intermix of GENx-2B67, GENx-2B67B and GENx-2B67/P engines is allowed in accordance with a method approved by the FAA.

注释/NOTE 5:

批准使用以下中国燃油/The following Chinese fuels are approved for use:

1. 满足中国 GB6537-2006 规范要求的燃油。/Fuels that meet the requirements in the Chinese GB6537-2006 Specification.

2. 批准按 GB6537-2006 规范中规定的浓度使用以下添加剂/The following additives in the GB6537-2006 Specification are approved for use at the concentration specified in the specification.

(1). 抗静电剂/Static Dissipater Additive: Statis 450.

(2). 抗氧/Antioxidant: 2,6-ditertiary-butyl-4-methyl-phenol.

(3). 防冰剂/Icing Inhibitor: Diethylene glycol monomethyl ether.

(4). 金属钝化剂/Metal Deactivator Additive: N, N'-disalicylidene-1, 2-propanediamine.

抗静电剂 T1502、防冰剂 ethylene glycol monomethyl ether 及抗磨剂 T1601、T1602 未被批准使用。/Static dissipater additive T1502, anti-icing additive ethylene glycol monomethyl ether and antifriction additives T1601, and T1602 are not approved for use.

注释/NOTE 6:

包含后续经批准的版本。

Including the subsequent approved version(s).

注释/NOTE 7:

已按 14 CFR 25.3(c) 和 25.1535 评估了 747-8 型飞机型号设计可靠性和性能, 当按波音公司文件 D611U364-01 “747-8 飞机 ETOPS 构型、维护和程序” 运行和维护时, 适合于延程运行 (ETOPS)。ETOPS 型号设计批准适用于 2015 年 2 月 17 日之后获得初始适航证的 747-8 飞机。该符合性判定不构成 ETOPS 运行批准。/The type design reliability and performance of the Model 747-8 airplane has been evaluated in accordance with the type design requirements of 14 CFR 25.3(c) and 25.1535 and found suitable for Extended Operations (ETOPS) when operated and maintained in accordance with Boeing Document D611U364-01 "747-8 ETOPS Configuration, Maintenance, and Procedures". ETOPS type design approval is applicable to 747-8 airplanes

that were issued an original airworthiness certificate after February 17, 2015.
This finding does not constitute approval to conduct ETOPS operations.